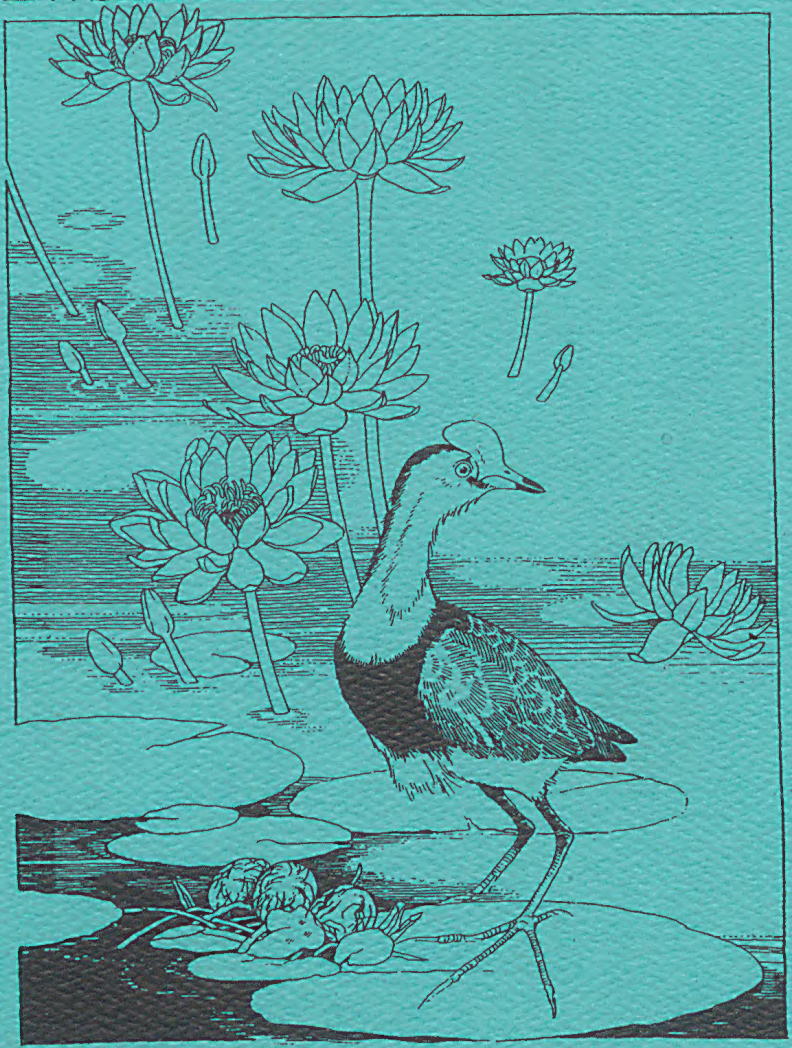
# AUSTRALIAN SOCIETY FOR LIMNOLOGY

# NEWSLETTER



VOLUME 28. NUMBER 1. FEBRUARY 1990

Registered by Australia Post
Publication No. WBG2179

# Australian Society for Limnology

Office-Bearers - 1989/90

| | |
|---|---|
| President: ..... | Dr Rod Oliver |
| ..... | MDRFC, PO Box 921, Albury, NSW,2640 |
| ..... | (060) 431 004 |
| Vice-President: ..... | Dr Stuart Bunn |
| ..... | School of AES |
| ..... | Grifith University |
| ..... | Nathan, Qld.,4111 |
| ..... | (07) 275 7407 |
| Immediate Past ..... | Dr Jenny Davis |
| President: ..... | Biological and Environmental Sciences, |
| ..... | Murdoch University, |
| ..... | Murdoch WA 6150 |
| ..... | (09) 332 2628 |
| Membership ..... | Mrs Margaret Hart |
| Officer/Treasurer: ..... | 22 Netherby Avenue, Mulgrave, |
| ..... | Vic.,3170 |
| ..... | (03) 560 4406 |
| Secretary: ..... | Dr Richard Marchant |
| ..... | Museum of Victoria, |
| ..... | 71 Victoria Crescent, |
| ..... | Abbotsford, Vic., 3067 |
| ..... ..... | (03) 419 5200 |
| Newsletter Editor ..... | Dr Jenny Davis |
| ..... | Biological and Environmental Sciences, |
| ..... | Murdoch University, |
| ..... | Murdoch WA 6150 |
| ..... | (09) 332 2628 |
| Presentation and Layout; ..... | Faye Christidis |
| Editorial Assistance: ..... | Faye Christidis ,Colleen Hubbard |
| ..... | Murdoch University, |
| ..... | Murdoch WA 6150 |
| Cover Design: ..... | Margaret Menadue |

Regional Executive Members 1989/1990

Ms Naomi Rea
Biology Department
University of Adelaide,
PO Box 498
Adelaide, S.A., 5001.

Dr Angela Arthington
School of AES,
Griffith University,
Nathan, Queensland, 4111

Dr Roger Croome,
RWC, 590 Orrong Rd,
Armadale,VIC. 3143
(03) 508 2667

Dr Ross Hyne
Office of the Supervising Scientist,
PO Jabiru , NT, 5796

Mr Colin Heath
Biology Department
Metro Water Sewage and Drainage Board
PO Box 2, Guildford,NSW. 2161

Dr Peter Davies
Inland Fisheries Comission
127 Davey Street,
Hobart, Tasmania, 7000

Dr Richard Norris
Applied Science, CCAE
PO Box 1,
Belconnen, ACT, 2616
(062) 522 543
Fax (062) 522999

Mr Adrian Pinder
Biological and Environmental Sciences
Murdoch University,
Murdoch, W.A., 6150
(09) 332 2208

Australian Society for Limnology Newsletter

Volume 28 Number 1 February 1990

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Material for publication in the May issue of the Newsletter should be sent to the Editor before 30 th of April 1990.

Long articles would be appreciatively received in any one of the following three modes: as camera-ready laser printed copy (New York, 12pt, fully justified), as formatted text on Macintosh disc, or as unformatted text on IBM or IBM compatible discs.

## Australian Society for Limnology

The Australian Society for Limnology is an association of over 400 people with professional or amateur interests related to Australian inland waters. Since its inception in 1961, the Society has played an important role in fostering limnology in this country. The ASL promotes liaison between limnologists in academic, private and governmental institutions and has a vested interest in the conservation of aquatic and related resources. Annual conferences are held near centres of limnological interest, and the programme includes scientific sessions, field excursions and social activities.

The ASL produces a newsletter with notes on activities, articles of general interest, book reviews and conference announcements; a Bulletin of original scientific papers and occasional Special Publications. A further publication is the Directory of Australian Limnologists.

Membership details

Membership applications are welcome; five classes of subscribing membership are available:

| | |
|---|---|
| Ordinary Members: | $20.00 |
| Student Members: | $10.00 |
| Life Members: | $200.00 |
| Institutional Members: | Fees on application |
| Sustaining Members: | Fees on application |

Membership subscriptions cover the period from 1 July to 30 June and members receive all publications. Members may also choose to receive the Australian Journal of Marine and Freshwater Research, the Australian Journal of Zoology and/or the Australian Journal of Botany at reduced rates. The subscription period for each journal is the calendar year following the year in which the subscription is paid.

Enquiries relating to membership should be directed to:

Mrs M. Hart
Treasurer/Membership Officer ASL
22 Netherby Avenue
Mulgrave Vic. 3170
(03) 560 4406

*EDITORIAL*

Happy New Decade - or Happy New Year if you are convinced that the new decade starts in 1991.

As is usual for the first newsletter after Christmas this is a fairly slim edition. It is also the last newsletter to be produced at Murdoch. After three years the time has come to relinquish the not onerous but never-the-less time consuming task of newsletter editing and production to pursue the finishing of projects, writing of reports and papers and the ever receding goal of attempting to obtain something that equates with a permanent position in limnology. The task of giving up the newsletter has been made virtually guilt free because of the fact that two well known ( infamous ?) and exceedingly literate Melbourne limnologists have indicated, with a minimum of coercion, that they would probably be willing to take it on. In the interests of protocol their identities must remain anonymous until the Executive formally nominates a new editor or editors at the next (Jabiru) AGM.

My final editorial task is to thank everyone who has contributed to the newsletter over the last three years and to thank ,in particular, Margaret Hart and everyone at Murdoch who has been involved with its production and posting out.

See you at Jabiru,

Jenny Davis

## Jolly Award - 1989

The Jolly Award Committee recommended that the Jolly Award for 1989 be made to Dr Ian Campbell.

Dr Campbell is a Senior Lecturer in Biology at Chisholm Institute of Technology. He is known nationally and internationally for his scientific work on mayfly biology, extending from taxonomy to life history and ecology. He has published extensively on this subject.

Dr Campbell was responsible for the introduction of biology teaching at Chisholm Institute, and with other colleagues for the introduction of a major study in Aquatic Science within a Bachelor of Applied Science degree program; he has also been actively involved with the Chisholm Institute Graduate Diploma in Water Science.

Dr Campbell has also been active in the applied aspects of limnology, particularly through his involvement (mainly in Victoria) in the application of stream ecology to river management, mainly in projects on environmental flow allocations for the Department of Water Resources.

ASL members will also be aware of the excellent work Dr Campbell has done as an active member of the Society over many years (Sec./Treasurer 1978-81; Editor 1983-85; Vice-President 1984-85; President 1985-87. Dr Campbell is the only person who has served two terms as President.

Dr Ian Campbell is a worthy recipient of the Australian Society for Limnology Jolly Award.

## Jolly Award Regulations

The current secretary of the Jolly Award Committee, Dr. Barry Hart, requested on behalf of the committee that the ASL executive establish a set of procedures and selection criteria for the Jolly Award. The following guidelines have been formulated by the ASL executive, with advice from previous recipients of the Jolly Award.

The Jolly Award commemorates Hiliary Jolly, a founding member of the Australian Society for Limnology, and is presented to a person who in the opinion of the Society, has made an outstanding contribution to Australian Limnology. The Jolly Award has become the Society's most prestigious prize, considered by members to indicate overall scientific excellence and outstanding achievement. The following guidelines have been developed with a view to maintaining the stature of the Jolly Award.

**Regulations concerning the structure and functioning of the Jolly Award committee.**

Membership and meeting of the Jolly Award Committee

1. The committee shall consist of the three most recent recipients of the Jolly Award. If this is not possible then past recipients, chosen in chronological order, will be added to the committee until it comprises three members.

2. The constituted committee should discuss the award, preferably together at a meeting or by telephone. If this is not possible, for example if a member of the committee is to be absent from the country for an extended period, then that member should be replaced as described in point 1. The committee may seek the opinion of the absent member by post or fax.

3. The committee's chairman will be the most recent recipient of the award and he/she will be responsible for organising the call for nominations, circulating nominations and arranging suitable meetings for the selection process. The secretary of the Australian Society for Limnology will maintain records and assist the chairman as required, but will not have voting rights.

4. The decision to make the award must be unanimous, except if a nominee has been promoted to go forward by two members of the committee, during two consecutive annual rounds of selections. In this case the President and Vice-president of the Society will be asked to join the committee and an award can be made on a majority decision. If an award is not made, then the situation will revert to normal for the following year.

5. A committee member may not vote on a nominee who works in the same department or shares research projects. If it becomes apparent that such a conflict of interests may occur, then the committee member should be replaced as described in point 1.

Nominations

1. Any person may be nominated for the Jolly Award.

2. Only financial members of ASL may nominate a person for the award. The nomination must be in writing and must be seconded by a financial member of the Society. Nominations must include a brief supporting statement and a current copy of the nominee's CV.

3. Nominations will remain valid for three years, after which a person can be re-nominated as in point-2.

4. A Society member may be the primary nominee for only one candidate.

Selection Criteria

1. The Jolly Award is not an annual award, but is made on the basis of an outstanding contribution to Australian limnology. The selection committee should ensure that the stature of a successful candidate is commensurate with that of previous recipients.

2. A primary consideration is excellence in a field of limnological research, as demonstrated by key research papers and scientific publications.

3. Consideration should also be given to candidates who have played a major role in the advancement and dissemination of limnological knowledge, particularly where this enhances the information available on Australian aquatic ecosystems.

4. The award is not intended for administrative excellence or for service to ASL. These are more appropriately recognized by other awards, such as life membership of the Society.

Citation

The announcement of an award will be made at the annual conference and will appear in the Society's Newsletter accompanied by a citation describing the reasons for the award.

Award value

The nature and value of the award will be determined by the Executive Committee of the society.

Rod Oliver
President

**Australian Society for Limnology Minutes of the Annual General Meeting held at the CCAE, Canberra, ACT on 9 July 1989**

The meeting started at 3.40pm. In the Chair - the President, J. Davis.

1. The agenda was adopted on the motion of A. Boulton, seconded by R. Shiel.

2. Apologies were received from: R. Tilzey, J. Bowling, P.S. Lake, T. Wrigley, A. McComb, P. Horwitz, M. McKaige.

3. Minutes of the last AGM were accepted on the motion of B. Hart, seconded R. Oliver.

4. President's report: this was given by the President and will be published in a forthcoming newsletter. The President thanked M. Hart and R. Marchant for their work during the year; she also thanked R. Norris and W. Maher and their committee at the CCAE for organising the 28th Congress. In addition, she thanked M. Finlayson and D. Holdway for their initial work on next year's Jabiru conference.

5. Secretary's report: apart from dealing with constitutional matters and increases in FASTS fees (which will be discussed later), the secretary reported that the remaining correspondence that he had received was routine.

6. Membership Officer/Treasurer's report: current membership is 370 ordinary members. Some overseas members have asked that the newsletter be sent airmail. There will be no increase in the price of CSIRO journals over the next year. The financial statement was presented (see attached) and was accepted on the motion of D. Cheng and seconded by M. Barson.

7. D. Mitchell moved that an honorarium of $500 be paid to M. Hart. This was seconded by R. Oliver and passed unanimously. D. Mitchell also proposed a vote of thanks to M. Hart. This was seconded by R. Marchant and also passed.

8. The Auditor's report (attached) was read to the members and accepted on the motion of L. Barmuta, seconded T. Hillman.

9. Editor's report: this was read to the members by the secretary. The former editor (P.S. Lake) informed members that ASL Bulletin No. 12 was finally produced after many delays and sent to M. Hart in May this year for distribution. Since then only one MS has been received and this has been returned for extensive revision. S. Bunn (the new editor) told members that Prof. H.B.N. Hynes' key to the Tasmanian Stoneflies had been published as an ASL special publication and would be distributed to members. He then explained how he (and the executive) felt that the ASL Bulletin should from now on publish only thematic MSS, e.g. identification guides or congress symposia, that would fill a complete issue; short isolated papers would no longer be solicited. Refereeing standards would be maintained. Discussion of the bulletin then ensued. Finally a motion was passed (proposed D. Mitchell, seconded B. Hart) that the ASL accept the editor's suggestion for revision of submission standards to the bulletin. These would be published in the next issue of the newsletter.

10. Newsletter Editor's report: the editor (J. Davis) reported that the newsletter would be published for another year from Murdoch Uni. She acknowledged the help of F. Whittles. A new editor would, however, be needed after next year's congress as she wished to step down then.

11. Jolly Award Committee report: this report was given by B. Hart who announced that the award had been made to I. Campbell. A report on the nomination would be sent to the newsletter.

12. Student Award Committee report: L. Barmuta (Chairman) announced that this year's winner was M. Cassanova from the University of New England. The committee had a difficult job deciding on the winner because of the generally very high standard of all the student papers.

13. Student Travel Award Committee report: R. Marchant reported that only one student applied (J. Hoey) and that she was awarded $300. It was suggested that supervisors should cajole students into applying for these awards and generally make sure all students were aware of their existence. It was also suggested that the amount of the award be increased; this was left to the new executive to implement.

14. Door Prize Committee report: T. Doeg reported that a large number of potential winners were identified. However, the committee had decided on J. Chaplin (University of Wollongong) for her talk about the sex lives of ostracods.

15. 29th Congress in Jabiru: R. Hyne (who has taken over the chairmanship of the organising committee from M. Finlayson) spoke about this meeting. A total of 20 $300 travel grants would be made available to members. The meeting would be held in the Crocodile Hotel in Jabiru. He suggested a four day meeting should be held with a tour of the Ranger Uranium mine and a symposium on heavy metal pollution on the first day. Concurrent sessions would probably not be held because of the cost of hiring additional rooms at the hotel; this was, however, yet to be decided and depended on the number of papers submitted. Accommodation was of two sorts: luxury at $90 per day for a room at the hotel, or basic, i.e. camping in the camping grouond which was due for completion in April. The OSS offered to provide a free bus to collect participants from the Darwin airport and to transport them to and from Jabiru. Meals could be readily obtained in Jabiru. Abstracts would be called for in the November newsletter this year. A leaflet about commercial tours would also be distributed at this time. Creche facilities could probably be provided if necessary.

16. Future congresses: 1991 in Melbourne; 1992 Tasmania - an offer of organisation was made by P. Davies.

17. Election of the executive; the following were elected unopposed:

President: R. Oliver (NSW) Vice-President: S. Bunn (Qld) Membership Officer/Treasurer: M. Hart (Vic.) Secretary: R. Marchant (Vic.) Executive: R. Croome (Vic.) C. Heath (NSW) A. Pinder (WA) R. Norris (ACT) P. Davies (Tas.) R. Hyne (NT) A. Arthington (Qld) N. Rea (SA)

18. General business: (a) Increase in FASTS fee: the executive recommended a decrease to associate membership rather than paying the increase requested by FASTS ($2.50 pa to $3.50 pa). During discussion that followed it was pointed out that there had been much discussion of FASTS in other biological societies; also it was noted that it was unreasonable to expect FASTS to provide specific assistance to each society. J. Skidmore told members that a move had been initiated by the Australian Institute of Biology (see letter from Tony Wicken in ASL Newsletter, Vol. 27, No. 2, May 1989) to form a Biological council and would work through FASTS. Such a council could provide rapid responses to FASTS on biological issues. A motion was finally proposed by I. Campbell that the ASL retain its membership of FASTS at the current rate or, if this was unacceptable, reduce its membership to an associate at the new rate ($0.35 pa per member). (This was seconded by J. Skidmore.) The motion was passed.

(b) R. Marchant (the secretary) proposed that the suggested changes to the constitution that he had published in the latest newsletter should be accepted by the society. This was seconded by T. Hillman and passed.

(c) B. Hart proposed (and M. Mannion seconded) that the Jolly Award should be increased from $150. This was left to the executive to implement.

(d) R. Shiel has volunteered to produce the limnological bibliography. The Society thanks both R. Shiel and R. Tait for their work and the secretary was asked to write to R. Tait thanking him for his effort. R. Shiel told members the accumulated bibliographies were available from him.

(e) T. Hillman moved (and R. Marchant seconded) that the president be thanked for her contribution to the Society over the last year and be congratulated on the birth of her first child. This was passed with acclamation.

(f) J. Harris explained to members that the Heritage Commission was still interested in limnological sites for its register. He will write a note for the newsletter to this effect.

(g) D. Cheng announced that the 2nd International Conference on Trace Metals will be held at the University of Technology, Sydney, in April 1990 and urged ASL members to attend.

(h) The president brought to the members' attention that two requests for financial assistance to sponsor limnological activities had been received by the Society. A discussion of such expenditure by the ASL followed but it was generally felt that financial decisions should be left to the executive. It was also suggested that the executive draw up guidelines for this sort of expenditure.

The meeting closed at 5.30pm.

R. Marchant, Secretary

# TOWARDS A NEW SCIENTIFIC IMPRINT

by

Timothy J. Doeg

For too long now, the scientific literature has been in a state of depressed torpor. Scientists, men and women with the imagination to visualise a world with more than three dimensions, or the behaviour of sub-atomic particles, have failed to take advantage of the great communications revolution.

Traditionally, the scientific literature has been printed in regular journals, sets of bound papers with some linked theme. But producing and printing a journal is expensive, so the written material must be made as short as possible. And editors ensure that every wasted word is expunged from the manuscript. But even scientists have limits as to how short they can express themselves and still get the idea across adequately.

Put simply, many current scientific papers are simply boring. The stilted, unnatural language, written in the third person, simply does not give the impression of the brilliance behind many of the ideas presented. It is little wonder that the public image of scientists is of anti-social, humourless beings, squirrelled away in laboratories, secluded from the outside world.

But, in the near future, we may see the situation change. As personal computers, now a necessity rather than a luxury, get faster and more powerful, and the humble floppy disk storage capacity approaches the astonishing, the opportunities for change are immense. Computer generated graphics have evolved to the point where crystal clear moving pictures will soon be the norm, rather than the exception.

The idea is simple. Like electronic mail, and some of the more enlightened computer magazines, scientific publications should be made available on computer disks. This would open a whole new field of publication possibilities.

Imagine. You are sitting at your desk, working on some monumental piece of science, and the mail arrives. Opening the small padded package (cheaper to post!), you find the latest floppy disk edition of AJMFR. Slip the disk into your super-fast, high-quality graphics, personal computer and run the "Read Journal" program.

The index of the papers on the disk comes up. Selecting one that may be of interest, you highlight the title and hit the return button.

To the strains of some inspirational music (perhaps Handel's "Water Music" or Talking Head's "Take Me to the River"), the title and author's names come up in vivid colour on the screen. Scroll to page 2 and the screen splits in two.

In the left window, you control the speed that the text of the paper scrolls past. On the right, the graphics driver in the computer detects which paragraphs are being read and runs through the appropriate visual elements of the paper.

As the introduction scrolls past, you may notice that the language used is different. Unconstrained by the space limitations of the printed page, the text is more personal, like that of a seminar presentation, as if the author was talking just to you. You read "My colleague, the famous French limnologist, Dr Richard Marchant....", and the high quality graphic of the said colleague appears on the right of the screen.

Descriptions of study sites in traditional papers are never adequate. You can never picture exactly what it looks like, or how it compares with your own. And photos in print, expensive to produce and generally discouraged by journal producers, tend not to help much. The computer disk paper overcomes this. As "The study site was located in the mountains of...." comes up in the text, the video view of the site is run on the right. "Ah, so that's what it really looks like...."

The same problem exists with the study methods. The abbreviated accounts in printed papers rarely describe the methods adequately. In freshwater biology there is a standard quantitative sampling apparatus for benthic invertebrates known as the Surber sampler. First used in 1937, it seems that every subsequent project has changed the design to fit local conditions. Rather than present full details of the new design, which may take a page with a diagram, the description is often reduced to simply "a modified Surber sampler". But what exactly is the Surber sampler they used?

Other questions that always spring to mind when reading the methods section include "how good was their sample processing?" and "how confident can you be of the results?". And there is always the question as to whether the authors actually did what they say they did.

As the text scrolls across the screen, the equipment is projected onto the graphics window. A short video graphic of the methods comes up. You can almost be there as they take the sample or administer the treatment to the experimental plot. Just how confident you can be of the results to follow is often obvious from the demonstration.

And the results become far clearer than ever. "Species diversity was observed to decrease...." as the graph of species against time magically appears on the screen, the data points appearing in sequence, emphasising the decrease with time. Moving arrows on the screen can direct the reader to other important aspects of the data on the graph. Instead of delving through tables of results, looking for the important points, the vital data can be highlighted by having the values flash different colours, ensuring that the point the author wants to make is made clearly. Communication of results is the key to scientific publishing and the disk-based journal allows this to be done with maximum efficiency.

In the discussion, significant previous references can be shown in the right window as they are mentioned in the text, eliminating the necessity to stop reading and search the reference list at the end of the paper. Graphic modelling of new theories or views would give weight and clarity to the argument the author is trying to present. As they say, a picture is worth a thousand words. In the disk-based paper, the picture may be worth far more than that.

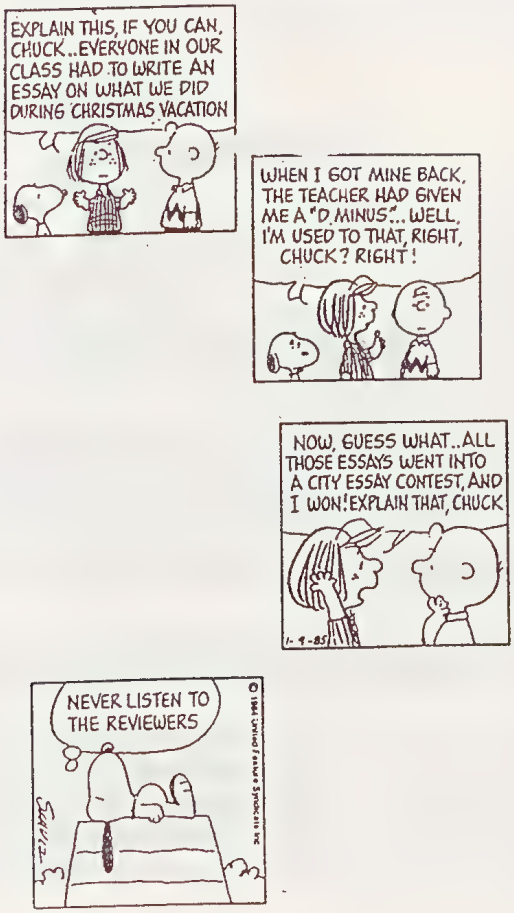
And all those people who invariably contribute much to the production of any scientific work - the technicians, volunteers, typists and artists - can receive due recognition with a photo or personal message.

And of course, if you want a hard copy of the paper to peruse at your leisure, simply hit the print button and the traditional style paper appears in seconds on your printer.

And this may only be the start. As computers get more powerful, access times drop dramatically and disk storage increases, one can see the day when the disk copy of the paper runs the commands for your holographic laser, and the particular sampling method appears life-size in your own office. A description of a complicated medical operation may be replayed in 3-D on your desk, without the messy cleaning up after.

The benefits of the disk-based paper are enormous. It saves on the wasteful use of paper (environment, environment!), it allows more data to be presented, more clearly. And it would allow a more interesting presentation, with music and graphics. We would read more papers, be better read, more informed, and more entertained. With such an image presented to the public, the image of scientists would change to something a bit more interesting than before.

The format and presentation of scientific results would only be limited to the imagination of the author, and for scientists with the ability to conceive concepts such as the universe, the electron or evolution, disk-based papers could prove to be an exciting change of direction for scientific publications.


EXPLAIN THIS, IF YOU CAN, CHUCK..EVERYONE IN OUR CLASS HAD TO WRITE AN ESSAY ON WHAT WE DID DURING CHRISTMAS VACATION
WHEN I GOT MINE BACK, THE TEACHER HAD GIVEN ME A "D MINUS"... WELL, I'M USED TO THAT, RIGHT, CHUCK? RIGHT!
NOW, GUESS WHAT..ALL THOSE ESSAYS WENT INTO A CITY ESSAY CONTEST, AND I WON! EXPLAIN THAT, CHUCK
NEVER LISTEN TO THE REVIEWERS

## Changes to the Constitution

The changes that were proposed in the last issue of the newsletter were carried by an overwhelming majority in the postal ballot - 49 of the 50 ballots I received. I apologise for the fact that some members may not have received their newsletter until after the 20 December deadline for receipt of votes. I have accepted all votes that were sent in regardless of when they arrived. It was necessary to impose some deadline, however, because Corporate Affairs (Victoria) wished to know whether the society intended to pursue incorporation after the first unsuccessful attempt.

I have sent the revised Constitution to Corporate Affairs and hope to hear from them soon. With luck the Society will be incorporated by the next AGM.

Richard Marchant, Secretary

## NEWS FROM FASTS

Gearing up for a Federal Election.
With the Government planning an election in early 1990, FASTS is developing policies in Science and Technology and Education which it believes should be pursued in Australia. To do this FASTS will be using its five Standing Committees and relying on the discussion by Member Societies at the FASTS Policy Forum held on 1 November.

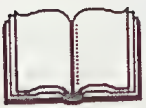
Woman and Mathematics, Science and Technology.
FASTS has established a high-level committee to look at the issue of a projected short fall in personnel in key areas of mathematics, science and technology. One of the committee's areas of focus will be the encouragement of trained women back into the workplace and developing the talent of more young people.

Forum on the Report of the Discipline Review of Teacher Education in Science and Mathematics Academy "DOME" - 25 February 1990, 10am.
FASTS, the portfolio of Employment Education and Training and the Australian Academy of Science will host a forum on the Discipline Review Report due for release in early January. Key speakers will include Ruth Dircks, President of the Australian Science Teachers' Association and Max Stephens from the Australian Association of Mathematics Teachers.

## Workshop on Biological Toxicity Testing as a Regulatory Mechanism

Proceedings of this workshop, held on 4-7 September 1989 in Darwin and Jabiru, will be available shortly. For further information or orders, contact Tony McGill, Director, Alligator Rivers Region Unit, N.T. Department of Mines and Energy (089) 89 6470.

The workshop was sponsored by the N.T. Department of Mines and Energy, the Office of the Supervising Scientist and Ranger Uranium Mine. It focussed on ways of incorporating biological testing protocols into regulations for water releases from the Ranger Mine. The workshop proceedings include 17 papers and a summary of the workshop discussions.



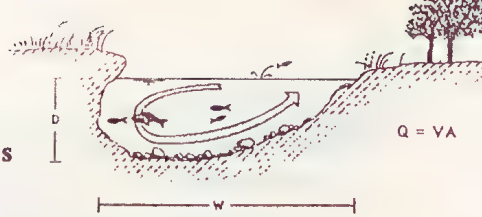
**New Book**

Aquatic Plants of Tasmania
Text by Jodelyne M.R. Hughes. Illustrations by Georgina L. Davis.

This book aims to list the obligate and some of the semi-aquatic plants of Tasmania. Each species is accompanied by a brief descrition ± a distribution map and ± an illustration, and is divided into three sections - ferns, monocotyledons and dicotyledons.

Available from: Department of Geography, The University of Melbourne
Cost: $15

## Habitat and Hydrology of Streams




The Centre for Environmental Applied Hydrology, University of Melbourne, held a "Habitats and Hydrology" workshop on 15-17 November at a school camp near Buxton, Victoria.

Dr Robert Newbury, a stream hydrologist from Canada, gave the captive audience (almost literally) of 22 a thorough description of stream patterns at drainage basin, stream reach, and local flow scales. The participants were divided into four groups, led by CEAH staff, to do assignments on catchment geometry and flood frequency analysis and to collect and analyse measurements of depth, width, discharge, slope and streambed materials at sites within the Steavenson River basin (it rained during this time, but many were already well-immersed in their work since the rivers were near-bankfull). Results were compared and discussed in terms of how the natural stream geometry could be restored in degraded streams.

Dinner at the Fruit Salad Farm in Marysville on the second day was followed by a trip to Steavenson's Falls (lit at night by hydroelectric power) to see how a "knickpoint" on a stream longitudinal profile looked in real life. Afterwards, there were unconfirmed sightings of an ASL member chasing a wombat down the road from the falls.

On the last day, Dr Newbury used a desktop-sized flume to demonstrate hydraulic jumps while he described how aquatic insects and fish preferred hydraulic conditions which caused aeration and concentrated the movement of food. A video which he had produced for the Manitoba Habitat Heritage Corporation showed methods of stream rehabilitation in Canadian streams. As a final exercise, participants "restored" a small disturbed stream site by tossing in rocks and re-establishing a natural riffle pattern.

With his substantial background in both engineering and biology, Dr Newbury successfully "demystified" the symbols and equations of engineering to make them relevant to biological work. From comments, the participants (which included biologists, engineers and river managers) left with a new understanding of how engineering and ecology could be integrated in the restoration of natural stream habitats.

Nancy Gordon.

FIRST CIRCULAR

## CONSERVATION AND MANAGEMENT OF TROPICAL INLAND WATERS: PROBLEMS, SOLUTIONS AND PROSPECTS

A meeting to be held in Hong Kong
during the first week of September in 1991

### BACKGROUND

The rate of degradation of tropical inland-water habitats cannot fail to alarm limnologists everywhere. Our need to protect these habits is, however, hampered by our lack of knowledge of tropical systems. Like almost all other areas of scientific research, work on the tropical inland waters lags behind investigations upon their temperate counterparts. Obviously, such a phenomenon cannot be attributed to a paucity of research material in the tropics, but rather to historical reasons: a shortage of money and, to a lesser extent, a lack of expertise. This shortage of research funding is likely to continue in the foreseeable future, and hence tropical ecologists must try even harder to make use of their limited resources to attain maximum useful output. Of course, this may be achieved through careful planning of one's own research, but we believe that it is also important to increase communication and cooperation amongst researchers in different research areas and geographic zones. By doing so, we can tackle timely problems with the most appropriate methods, and appreciate the wider implications of our research findings in the context of protection and management of tropical inland waters. In particular, we can focus on approaches which will shed light on both the similarities and dissimilarities in patterns and processes operating in tropical and temperate latitudes.

We often expect ecological principles useful in explaining temperate processes to work equally well in the tropical environment. Although some phenomena may be universal, there is no *a priori* reason why tropical systems in general, and tropical inland waters in particular, should behave in the same way as their temperate counterparts. Instead of treating the study of tropical inland waters as a "branch" of temperate limnology, we should view tropical systems with fresh eyes, and try not to squeeze them into ecological frameworks such as the "River Continuum Concept" adopted by temperate limnologists. Our requirement for limnological theories and concepts relevant to the tropics is made even more urgent by the need for management and protection of tropical island waters.

Nevertheless, developments in temperate freshwater studies have provided us with indications as to the possible direction that we should be heading. For example, the recent application of experimental field manipulations to hypothesis testing by temperate freshwater investigators is clearly a powerful approach, but this has yet to be taken up by the majority of workers in the tropics. In addition, we appreciate the powers and limitations of both reductionist and holistic approaches in ecology. Indeed, some workers are convinced that information on the basic processes through which individual organisms function can be translated into population or even higher levels, and can eventually help us in formulating better approaches to large scale problems such as food production, environmental degradation, pollution and so on.

It is hoped that the proposed meeting will bring together limnologists from both tropical and temperate regions, and provide a forum where participants can express opinions, discuss ideas, share methodologies and initiate cooperation with the aim of understanding, conserving and managing tropical inland waters.

### SCOPE OF THE MEETING

We hope that the proposed meeting will help serve the purpose of protecting tropical inland waters by summarizing current knowledge, identifying areas where there are significant gaps in understanding, and indicating how these gaps may be filled using rigorous methods em-

ployed in such a manner as to answer specific questions.

FORMAT OF THE MEETING

The proposed meeting will consist of several sessions covering the following topics:

(1) Running waters - ecology and management;
(2) Standing waters and man-made lakes - ecology and management;
(3) Freshwater pollution and toxicology;
(4) Freshwater fisheries and aquaculture;
(5) Ways ahead - practical, logistic and funding considerations in the protection of tropical inland waters.

In addition we also hope to explore the role of freshwater bodies in the transmission and dynamics of parasitic diseases, and consider the influence of introduced species on the ecology of tropical inland waters.

Each session will start with an introduction followed by a combination of ordinary conference papers and review articles. The implications of these presentations will form the basis of a chaired discussion by all participants so that areas of common interest can be identified and appropriate methods for investigating such areas be discussed. In addition, each session will also involve two or more keynote speakers who will summarize the current state of that particular area of freshwater ecology as seen from their regional perspectives. The whole session will then be synthesized by the chairman to produce a series of recommendations for the protection of tropical inland waters. These, we hope, will provide direction and methodological guidance as to which problems in tropical limnology are timely, important and tractable.

ACCOMMODATION

The meeting will be held at or near the University of Hong Kong, Hong Kong. Basic on-site accommodation at or near the meeting site will be available at reasonable cost. This may include student halls of residence (shared bathing and toilet facilities, canteen food), as well as a limited number of rooms with private bathrooms.

Hotel accommodation in Hong Kong is plentiful but rather costly. Your local travel agent may, however, be able to arrange an airline ticket - hotel room package deal for you at reasonable rates.

Interested persons should write as soon as possible, to one of the undersigned. We would also welcome suggestions of additional relevant and timely topics for possible inclusion in the meeting.

CONTACT
Dr. David Dudgeon
Department of Zoology
University of Hong Kong
Pokfulam Road
Hong Kong

Dr. Paul K.S. Lam
Department of Applied Science
City Polytechnic of Hong Kong
Tat Chee Avenue
Kowloon
Hong Kong

# ECOLOGY INSTITUTE PRIZES 1990

## in the field of Terrestrial Ecology

Financed by research ecologists and non-profit-making, the international Ecology Institute (ECI) has a staff of 40 ecologists – marine, terrestrial and limnetic – all of high professional reputation. Neither the director nor any member of the scientific staff receives remuneration.

Every year a jury composed of ECI members selects – in a rotating pattern – prize winners among marine, terrestrial or limnetic ecologists. In 1990, prize winners will be selected in the field of terrestrial ecology.

ECI strives to (1) further the exchange of information between marine, terrestrial and limnetic ecology; (2) compensate for the lack of balance between analyzing and synthesizing research efforts and thus help to provide more feedback and critical overview for ecological sciences; (3) draw the attention of scientists, administrators, politicians and the general public to important issues resulting from ecological research; (4) assist in finding a long-term compromise between the increasingly destructive potential of modern industrial societies and the need for defining and applying measures to protect nature, commensurate with achieving and sustaining the highest possible living standard for man.

Taking into account these aims, as well as his or her own field of interest, the winner of the Ecology Institute Prize is requested to author a 200 to 300 printed-page book, to be published by ECI in the series 'Excellence in Ecology' (EE) and to be made available world-wide at cost price. A considerable number of books are donated to libraries in Developing Countries.

EE's concept is different from that of textbooks. In addition to reviewing a certain field of knowledge, it gives the authors a chance to express their personal views on important ecological issues, to interpret current scientific knowledge on the basis of their own experience and insight, and to tell us what, in their opinion, should be done in the future.

While there are several international prizes offered now in ecology, the Ecology Institute Prize is unique for 2 reasons: (1) it was established and is financed by research ecologists; (2) the prize gives and takes: it both honors the recipient and requires him/her to serve science which has a greater need now than ever for critical syntheses of the state of the art. The Ecology Institute Prize is endowed with a stipend of US $ 5000.

Providing adequate nominations are received, a second prize may be awarded honoring a young ecologist who has conducted and published uniquely independent, original and/or challenging research efforts representing an important scientific breakthrough the IRPE PRIZE (International Recognition of Professional Excellence) is endowed with a stipend of US $ 750.

PREVIOUS PRIZE WINNERS AND THEIR BOOKS

| | |
|---|---|
| 1986 Marine Ecology: | Tom Fenchel, Helsingør, Denmark – ECI PRIZE Book 1 'Ecology – Potentials and Limitations' (Published 1987; price DM 67 plus DM 5 for postage and handling)<br>Colleen Cavanaugh, Cambridge, MA, USA – IRPE PRIZE |
| 1987 Terrestrial Ecology: | Edward O. Wilson, Cambridge, MA, USA – ECI PRIZE. Book 2: 'Success and Dominance in Ecosystems: The Case of the Social Insects' (The book is scheduled to appear in 1990) |
| 1988 Limnetic Ecology: | Gene E. Likens, Millbrook, NY, USA – ECI PRIZE Book 3: 'Insights from Sustained Ecological Research: An Ecosystem Perspective' (The book is scheduled to appear in 1990) |
| 1989 Marine Ecology: | Robert T. Paine, Seattle, WA, USA – ECI PRIZE. Book 4 (title to be announced) will focus on marine ecological problems. |

*(Please address book orders to Ecology Institute, Nordbünte 23, D-2124 Oldendorf/Luhe, F.R. Germany)*

**SELECTION PROCEDURE:**

**Nominations are welcome from all research ecologists. They should reach the Chairperson of the ECI Jury (see below) before August 31, 1990. Eligible are all ecologists engaged in scientific research (except ECI's director and the Jury's chairperson; Jury members nominated will be replaced by other ECI members). The Jury will select the Prize Winner using the nominations received, as well as their own knowledge of top performers, and their own professional judgement.**

**Otto Kinne** (Director ECI)

Ecology Institute
Nordbünte 23
D-2124 Oldendorf/Luhe
F.R. Germany
Tel 04132/727
Fax 04132/8883

ECI TERRESTRIAL JURY 1990:

**Chairman: J. L. Harper, Cae Groes, Glan-y-Coed Park, Dwygyfylchi, Penmaenmawr, Gwynedd LL34 6TL, UK;** F. S. Chapin, III, Berkeley, USA; J. Ehleringer, Salt Lake City, USA. M. Gadgil, Malleswaram, India; M. Macfayden, Coleraine, Northern Ireland; S. Ulfstrand, Uppsala, Sweden; E. O. Wilson, Cambridge, USA

## ECOLOGY INSTITUTE Nordbünte 23, D-2124 Oldendorf/Luhe, Federal Republic of Germany

The ECOLOGY INSTITUTE (ECI) was founded in 1984. Located some 55 km south of Hamburg, Federal Republic of Germany, ECI is an international non-profit organisation of research ecologists.

AIMS: ECI's aims are to honor and support excellence in ecological research, further the exchange between marine, terrestrial and limnetic ecologists, and to narrow the gap between ecological science and its application for the benefit of nature and society.

Recognizing

- the insufficient cooperation and interchange among marine, terrestrial and limnetic ecologists
- the overwhelming flood of analytical research papers and the general lack of support for efforts towards critical syntheses
- the need to provide keys for opening the doors to scientific ecological information so that it becomes accessible also to non-experts and society at large.

ECI strives to

- further the exchange of information between marine, terrestrial and limnetic ecology
- compensate for the lack of balance between analyzing and synthesizing research efforts and thus help to provide more feedback and critical overview for ecological science
- draw the attention of scientists, university teachers, students, administrators, politicians and the general public to important issues resulting from ecological research
- assist in finding a long-term compromise between the increasingly destructive potential of modern industrial societies and the need for defining and applying measures to protect nature, commensurate with achieving and sustaining the highest possible living standard for man.

PRIZES: Every year, ECI selects and honors – in a rotating pattern – a marine, terrestrial or limnetic ecologist distinguished by outstanding scientific achievements. Two prizes are set out: The ECOLOGY INSTITUTE PRIZE and the IRPE Prize (International Recognition of Professional Excellence). Prize winners are nominated by the international community of research ecologists and selected by an ECI Jury.

The ECI Prize carries a stipend of US $ 5000. It gives and takes: it both honors the recipient and also requires him/her to serve science and society by authoring a book to be published in the series "Excellence in Ecology" and to be made available world-wide on a non-profit basis. A considerable number of books are donated to libraries of third-world countries. While the book must take into account ECI's aims, it offers the author a chance to express his/her personal views on important ecological issues.

The IRPE Prize carries a stipend of US $ 750. It honors a young ecologist who has conducted and published uniquely independent, original and/or challenging research efforts representing an important scientific breakthrough.

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*Procedure for selecting and awarding prizes*

*Nominations* are welcome from all ecologists. They should be addressed, with supporting documents, to the Chairperson of the ECI Jury.

*Eligible* are all ecologists engaged in scientific research, including ECI Staff members, but excluding ECI's Director and the Chairperson of ECI's Jury. A Staff member nominated will be excluded automatically from the Jury's activities, and be replaced by another Staff member selected by the Jury's Chairperson.

*The Jury* is appointed by ECI's Director. It consists of – in an annually rotating pattern – 7 marine ecologists, 7 terrestrial ecologists, or 7 limnetic ecologists. Jury members elect among themselves a Chairperson, and then select the Prize Winner(s) using the nominations received, as well as their own professional judgement.

*Selection.* Nominations and opinions of Jury members are circulated by the Chairperson among all Jury members. The final decision, which must take into account ECI's aims, is then made by majority vote of the Jury.

*Prize awarding.* The Chairperson of the Jury informs ECI's Director of the Jury's decision. The Director will then (a) organize procedural details for awarding the prize(s); (b) in his role as Editor of "Excellence in Ecology", discuss with the prize recipient concept, contents, title, etc. of the Prize Winner's book.

ECI Prizes are announced world-wide in appropriate outlets (journals, society circulars, meetings, etc).

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SCIENTIFIC STAFF 1990: Director: Professor Dr. O. Kinne, Oldendorf/Luhe, Federal Republic of Germany

**Marine Ecology**

Dr. F. Azam, La Jolla, USA
Prof. H.-P. Bulnheim, Hamburg, FRG
Prof. J. D. Costlow, Jr. Beaufort, USA
Prof. T. Fenchel, Helsingør, Denmark
Dr. N. S. Fisher, Upton, USA
Prof. J. Gray, Oslo, Norway
Prof. B.-O. Jansson, Stockholm, Sweden
Dr. G. I. Müller, Constanta, Romania
Prof. E. Naylor, Bangor, UK
Prof. S. W. Nixon, Narragansett, USA
Dr. T. Platt, Dartmouth, Canada
Prof. G. G. Polikarpov, Sevastopol, USSR
Dr. T. S. S. Rao, Bambolim, India
Acad. Prof. A. Zhirmunsky, Vladivostok, USSR

**Terrestrial Ecology**

Prof. T. N. Ananthakrishnan, Madras, India
Prof. F. S. Chapin, III, Fairbanks, USA
Prof. J. Ehleringer, Salt Lake City, USA
Prof. M. Gadgil, Bangalore, India
Prof. J. L. Harper, Bangor, UK
Prof. E. Kuno, Kyoto, Japan
Prof. A. Macfayden; Coleraine, UK
Prof. H. Remmert, Marburg, FRG
Dr. M. Shachak, Sede Boker Campus, Israel
Acad. Prof. V. E. Sokolov, Moscow, USSR
Prof. Sir R. Southwood, Oxford, UK
Prof. S. Ulfstrand, Uppsala, Sweden
Prof. E. O. Wilson, Cambridge, USA

**Limnetic Ecology**

Prof. J. I. Furtado, London, UK
Prof. S. D. Gerking, Tempe, USA
Prof. J. E. Hobbie, Woods Hole, USA
Prof. G. E. Likens, Millbrook, USA
Prof. K. Lillelund, Hamburg, FRG
Prof. R. Margalef, Barcelona, Spain
Prof. J. Overbeck, Plön, FRG
Prof. T. J. Pandian, Madurai, India
Prof. E. Pattée, Villeurbanne, France
Prof. T. B. Reynoldson, Bangor, UK
Prof. D. Uhlmann, Dresden, GDR
Prof. W. Wieser, Innsbruck, Austria
Prof. W. D. Williams, Adelaide, Australia

## *STATE and TERRITORY AFFAIRS*

### *NEW SOUTH WALES*

Correspondent: Colin Heath,Water Board Environmental Science, PO Box 53, Sydney South 2001.

We are sick of the space in the NSW section of the newsletter and thought that we had better do something about it. Starting with the Sydney Water Board, we will give a brief profile of the limnological work being done throughout NSW. Other groups and individuals throughout the state are invited to send information about their work, write to: Col Heath, PO Box 53, Sydney South 2001.

Sue Shaw of Receiving Resources (Water Board Scientific Services) is continuing a study on algal growth potential which began in 1977. The study aims to determine algal growth levels in natural waters, related in particular to the nitrogen and phosphorous concentrations. Work is being carried out in several areas related to the Board's region of responsibility. These areas include the Nepean/Hawkesbury River and the Georges River.

Derek Cannon is also working on N/P content, but is monitoring the Hawkesbury-Nepean which has high urban and agricultural runoff, and receiving waters from Western Sydney and the Blue Mountains sewage treatment plants. Derek monitors algae at regular intervals on the river including during flood conditions, and conducts special enquiries into algal problems.

Alex Williams and Mirella Russionello, from other sections within Scientific Services, monitor algal conditions from the reticulated water system and storage reservoirs.

The Stream Studies Group was established in late 1988, and since, five integrated studies have commenced in the aquatic ecology and water quality assessments of selected Blue Mountains' streams.

Lee Benson, who moved back to Townsville to complete a PhD, is nearing the completion of a series of pollution tolerance investigations, aimed at establishing a biotic index. The index will take into account the differing susceptibilities of macroinvertebrates to pollution stress and when used in conjunction with a chemical index, will provide a comprehensive assessment of stream water quality.

Ian Wright is monitoring physico-chemical parameters and biological features on a daily and seasonal basis, at comparable 'clean' and sewage impacted streams over a period of 12 months. The results will validate existing surveillance programmes.

As part of the Board's Graduate Programme, Ruth O'Connor and Gavin Atkins have been assigned a 12 month study designed to complement the pollution tolerance survey. The project denoted as integrated catchment management of the Katoomba region examines the impact of urban runoff and sewage effluent disposal on water quality and biotic communities of Leura Falls Creek and tributaries.

How can we forget Peter Swanson? He is going to monitor the performance of an emergent macrophyte artificial wetland treating urban runoff in the upper Blue Mountains at Katoomba. Peter is a Masters student from Canberra Uni. Construction and planting of the wetland should be completed very shortly.

Ian W. also doubles as an excellent de facto state correspondent. Col. H.

## *VICTORIA*

Correspondent: Leon Barmuta, Invertebrate Survey, Museum of Victoria, 71 Victoria Crescent, Abbotsford, Vic. 3067.

Late last year Dr Robert Newbury defied pilot's strikes and many other obstacles to give a workshop in hydrology in perfectly lovely surroundings near the Acheron River (where else?). The workshop was a run-away success, and Nancy Gordon and the Centre for Applied Environmental Hydrology are to be congratulated on its organisation. However, it should be noted that during one of the field sessions Dr Anderson, from Shepparton, displayed a few juvenile tendencies vis a vis large rocks, a pool of water and the people standing in it. The ensuing discussion descended to the same level of non verbal communication and several people got wet.

On a more serious note, John Anderson and Sandy Morison at Kaiela are (were?) hoping to attach a few transmitters to some native fish this summer to find out where they go, while those other famous inmates of the CFL zoo, John Koehn, Tim Doeg and Graham Milledge, have been pursuing the effects of logging on fish and bugs in the Otways. I'd like to tell you the name of their project, but I think it's been changed again.

Amongst the more exciting news is the secondment of Leon Metzeling from Dr Croome's establishment by the EPA to do something about statewide invertebrate monitoring, Phill Johnstone is switching jobs within the Rural Water Commission from computer mega-nerd to something more scientific, while the Monash-Chisholm merger continues to delight connoiseurs of novel approaches to conflict resolution. Propriety and the lack of secure, long-term employment prevent me from commenting further. Rumour also has it that the inimitable Trish Goeraghty has left the Chisholm fold permanently to pursue her excellent work at the Department of Water Resources in getting people to do the right thing in river management; persuading twenty-odd local councils and similar bodies in Westernport to agree to do something constructive is a major achievement. Well done and good luck, Trish.

Meanwhile 4.15 kg of reports and planning documents and things about rivers and wetlands in Victoria from various state agencies have hit the decks. As ever they seem to say we don't know very much.... which isn't news to most of us. A superficial assessment of these fine documents, I know. I promise more meaty reviews next newsletter, or next decade (anyone else interested in helping out? I reiterate there are 4.15 kilograms of 'em).

And.... well, what with Chrissy and the new year and all that there's not a lot else to report, is there? See ya at Jabiru, I hope.

## *WESTERN AUSTRALIA*

Corrispondent: Adrian Pinder, Biological and Environmental Science, Murdoch University, Murdoch 6150.

Firstly, congratulations are due to Jenny Davis who has taken up a lectureship in the Centre for Water Research in Environmental Science here at Murdoch University. The resulting shift to a new office several buildings away has created a boost for the paper recycling industry. Another new starter is Jane Growns who, fresh from submitting her PhD in Tassie, has taken over where Fiona left off (reportedly sample 1024) on the wetland classification project.

On the midge project Adrian and Kerry are busy trying to frustrate midge larvae by using synthetic insect growth regulators to prevent them from emerging as adults. They are currently seeking the services of a virgin willing to be sacrificed to the god of field experiments (Murphy - of Murphy's Law fame) as a token of appeasement. During the summer months Mark Garkaklis, Karen

McRoberts and Jack Mercer have been aiding and abetting them in the eternal struggle against those darn flies.

Ivor Growns, Shirley Balla and Mark Lund are currently trying to survive their 'ever' continuing Ph.D.s. At present most activity centers around the university computer terminal for the ever daunting task of statistical analysis. Belinda Robson is completing the last analyses before putting pen to paper and writing her Honours thesis on the effects of salinisation on the macroinvertebrate fauna of streams in wandoo forest north of Perth.

Jo Buckee and Halina Kobryn have begun honours and PhD projects respectively under the joint supervision of Arthur McComb and Jenny Davis. Jo will be studying yabbies in farm dams in the wheatbelt region, while Halina will be looking into land use in the Herdsman Lake catchment and effects on water quality, as well as the life-history of *Typha orientalis* in relation to fire-history. Arthur and Frank Salleo along with the W.A. Environmental Protection Authority, Scitech and the Education Department are organising a "Ribbons of Blue" project. This will involve primary schools in the monitoring of water quality inrivers and wetlands throughout the southwest of W.A.

The fisheries group at Murdoch are hosting Associate Professor Bob Bellig who is on sabbatical from the Gustavus Aldophus University in Minnesota. He will be looking at aspects of the biology and ecology of rays in the Nornalup Estuary. Another visitor soon to arrive is Frau Chinko of the Medical School of the University of Munich. She will be studying the elastin-like fibres of cyclostomes (lampreys). Tom Rose is finally getting close to finishing his PhD on the resource partitioning and food availability of estuarine fish communities. The other exiting news from the fisheries group is that Pia Geijsel will soon be heading off to Heard Island for a few months with the Antarctic Division where she will be testing out some of the equipment on the new Aurora Australis antarctic ship (upon hearing this 50 000 penguins are believed to have all taken their annual leave at once).

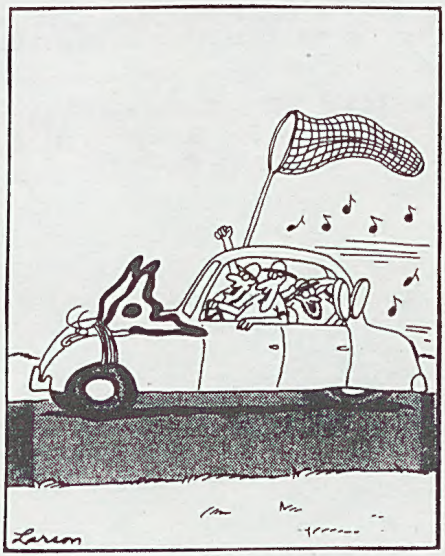
At the Aquatic Research Laboratory of the University of Western Australia work continues on the monitoring of headwater streams of the Canning, North Dandalup and Murray Rivers. A comparison of the invertebrate fauna of a number of stream habitats is also continuing, this is aimed at determining how representative riffle zone faunas are. The "regulated rivers study" investigating the reset of invertebrate faunas in rivers below dams has been

completed. The resulting report by Andrew Storey and Pauline Gazey has been submitted to the W.A. Water Authority. Andrew has now left the ARL to work with the Department of Conservation and Land Management on the utilization of south-west wetlands by waterfowl.

Peter Davies is finishing his PhD dealing with the relative importance of heterotrophy and autotrophy in Western Australian streams. He will soon re-take command of the ARL.

In lentic studies, David Cale continues his work on the establishment of invertebrate communities in artificial lakes created by mining. The aim of this project is to encourage self sustaining food webs capable of supporting breeding waterfowl.

Belinda Murray and Louis Lebel are coninuing their PhD studies respectively titled; "Life History Strategies of the Fauna of Temporary Headwater Streams" and "Factors Influencing the Distribution of Trichoptera in Headwater Sreams of the Northern Jarrah Forest".



## LIMNOLOGY BIBLIOGRAPHY [VOL. 28(1) 1990]

The bibliography is useful only if publishing members contribute to it. I had received notice of only 9 publications by the deadline...plus the arrival on Christmas Day (Anchorage, Alaska time) of Nicholas Tait to Jenny & Russ (Keeper of the Bibliography *in absentia*). Bibliographic details please, to: ASL Bibliography, MDFRC, P.O. Box 921 Albury, NSW 2640.

**BOWLING, L.C. 1989.** The optical properties and phytoplankton of lentic freshwaters from north-eastern New South Wales, Australia. *Arch. Hydrobiol.* **116**, 351-373.

**CAMPBELL, I.C. & T.J. DOEG, 1989.** Impact of timber harvesting and production on streams: a review. *Aust. J. Mar. Freshwater. Res.* **40**, 519-539.

**CULLEN, P. 1989.** Social choice, risk and determinism in water quality management. *Hydrobiologia* **176**, 1-6

**DAVIS, J.A. & L.A. BARMUTA, 1989.** An ecologically useful classification of mean and near-bed flows in streams and rivers. *Freshwater Biology* **21**, 271-282.

**DOAG, T.J., R. MARCHANT, M. DOUGLAS & P.S. LAKE, 1989.** Experimental colonisation of sand, gravel and stones by mcroinvertebrates in the Acheron River, southeastern Australia. *Freshwater Biol.* **22**, 57-64.

**KOSTE, W. & R. J. SHIEL, 1989.** Rotifera from Australian inland waters. IV. Colurellidae (Rotifera: Monogononta). *Trans. R. Soc. S. Aust.* **113**, 119-143.

**PEARSON, R.G. & R.K. TOBIN, 1989.** Litter consumption by invertebrates from an Australian tropical rainforest stream. *Arch. Hydrobiol.* **116**, 71-80.

**SINCLAIR, P., R. BECKETT & B.T. HART, 1989.** Trace elements in suspended particulate matter from the Yarra River, Australia. *Hydrobiologia* **176**, 239-252.

**SHELDON, F. & K.F. WALKER, 1989.** Effects of hypoxia on oxygen consumption by two species of freshwater mussel (Unionacea: Hyriidae) from the River Murray. *Aust. J. Mar. Freshwater Res.* **40**, 491-499.

## COMING EVENTS

**1990**

20-23 APRIL ASL 29th Congresss and AGM, Jabiru NT, and Pre-Congress Symposium on the 19th "Water Management in the Alligator Rivers Region". Enquiries: Isabell von Oertzen tel: (089) 792 300, Fax (089) 792 076, Telex 85457

2-7 JULY International Crustacean Conference, Brisbane, Australia. Contact:- Crustacean Conference Secretariat,Uniquest Limited, University of Queensland, St Lucia, Qld,4067.Ph (07) 377 2733, Fax (07) 870 3313

8-14 JULY. 2nd International Conference: Trace Metals in the Environment, Sydney. Contact: Dr. K.R. Brown, Conference Secretary, Trace Metals in the Aquatic Environment, Uni of Technology Sydney, PO Box 123, Broadway NSW 2007, Australia. Ph (02) 436 6220, Fax (02) 436 6211.

29 JULY-3 AUG International Association on Water Pollution Research and Control (IAWPRC) Biennial'90.Contact: Anthony Milburn, Executive Director, IAWPRC, 1 Queens Anne's Gate, London, SW1 H9BT, England. Ph:441 222 3848, Fax: 441 222 1818.

3-6 AUGUST International Conference of the Environmental Management of Enclosed Seas '90 Kobe, Japan For further information: Japan Society on Water Pollution Research Yotsuya New Mansion 307, 12 Honshiocho Shinjuku- ku Tokyo 160, Japan Telefax 81-3-351-2317.

23-30 AUGUST V International Congress of Ecology "Development of Ecological Perspectives for the 21st Century", Yokohama, Japan. Contact: Secretary General's Office for Intecol 1990, Inst. of Environmental Science and Technology, Yokohama National University, Yokohama 240, Japan.

5-8 SEP 1Vth International Conference on the Conservation and Management of Lakes "Hangzou'90". Hangzou, The People's Republic of China. Contact: Mr. Zhang Yuitan, Foreign Affairs Office, Chinese Research Academy of Environmental Sciences Beiyuan, Anwai, Beijing, People's Republic of China. Ph: 4211025, Cable: 1064, Telex: 22505 Booth CN.

**1991**

MAY XVII Pacific Science Congress, Hawaii. Contact: Dr. Jose Ireneu dos Remedios Furtado, Centre for Integrated Development, 19, Langford Green, Champion Hill, London SE5 8BX, England, UK. Ph (01) 733 8523, Fax (01) 299 0197.

September Conservation and Management of Tropical Inland Waters :Problems, Solutions and Prospects. Hong Kong.